

REMARKS

Prior to entry of this amendment, claims 20-33 are pending in this application. By this amendment, claims 20, 21, and 26 are amended, claims 22, 27, and 28-30 are canceled, new claims 34-41 are added, and claims 20, 21, 23-26, and 30-41 are presented to the Examiner for further consideration.

A. Introduction

In the outstanding Office action, the Examiner rejected claim 30 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement; rejected claims 20-23 and 25-33 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,500,743 to Lopatin et al. (hereinafter referred to as “the Lopatin et al. reference”) in view of U.S. Patent No. 6,316,297 to Matsuda (hereinafter referred to as “the Matsuda reference”); rejected claim 24 under 35 U.S.C. § 103(a) as being unpatentable over the Lopatin et al. reference in view of the Matsuda reference as applied to claim 20 and further in view of U.S. Patent No. 6,891,235 to Furukawa et al. (hereinafter referred to as “the Furukawa et al. reference”); and rejected claims 20-29 under 35 U.S.C. § 103(a) as being unpatentable over the Furukawa et al. reference in view of the Matsuda reference and the Lopatin et al. reference.

These rejections are respectfully traversed for at least the following reasons.

B. Asserted Rejection of Claim 30 Under 35 U.S.C. § 112, First Paragraph

In the outstanding Office action, the Examiner rejected claim 30 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

Applicants respectfully submit that this rejection is traversed as to claim 30 as it is canceled.

C. Asserted Obviousness Rejection of Claims 20-23 and 25-33

In the outstanding Office action, the Examiner rejected claims 20-23 and 25-33 under 35 U.S.C. § 103(a) as being unpatentable over the Lopatin et al. reference in view of the Matsuda reference.

Applicants respectfully submit that this rejection is traversed as to claims 22, 29, and 30 as they are canceled.

As amended, independent claims 20 and 26 now recite, in part:

-- a third element substantially parallel to the semiconductor substrate extending from a bottom of the first element into the undercut region --.

Support for this amendment appears in the specification, for example, in Figure 9. As depicted in this drawing, the third element of L-shaped spacer 175 extends from the bottom of the first element into the undercut region below gate pattern 140. Further support for this amendment appears in the specification, for example, on lines 20-21 of page 16:

For this, the lower spacer 175 may further have a horizontal extension extended to the undercut region.

As amended, independent claims 20 and 26 now further recite, in part:

-- a low-concentration impurity region formed in the semiconductor substrate substantially under the first and third elements --.

Support for this amendment appears in the specification, for example, in Figure 9, and in lines 15-19 of page 11:

Thus, a low-concentration impurity region 160 is formed in the semiconductor substrate 100 on both sides of the gate pattern.

It is preferable that the low-concentration impurity region 160 is formed also under the undercut region.

As amended, independent claims 20 and 26 now further recite, in part:

-- a mid-concentration impurity region disposed
between the high- and low- concentration impurity regions,
substantially under the second element --.

Support for this amendment appears in the specification, for example, in Figure 9, and in lines 18-20 of page 14:

As a result, a mid-concentration impurity region 205 is
formed under the horizontal projection of the lower spacer 175.

Applicants respectfully submit that the Examiner has failed to set forth a *prima facie* case of obviousness for at least the reasons set forth below.

The combination of the Lopatin et al. and Matsuda references fails to teach or suggest impurity regions arranged in the manner now recited in independent claims 20 and 26: Neither reference teaches or suggests a low-concentration impurity region substantially under the first and third elements of a spacer. The Examiner identified a spacer (2204) in the Lopatin et al. reference, but these inner sidewalls, as depicted in Fig. 22, lack a third element substantially parallel to the semiconductor substrate extending from a bottom of the first element into the undercut region, as now recited in independent claims 20 and 26.

The Matsuda reference fails to remedy the deficiencies of the Lopatin et al. reference. Accordingly, applicants respectfully request favorable reconsideration and withdrawal of the rejection of independent claims 20 and 26 under 35 U.S.C. § 103(a).

Claims 21, 23, 25, 27, 28, and 32 ultimately depend from independent claim 20. Hence, claims 21, 23, 25, 27, 28, and 32 are at least allowable as depending from an allowable base claim, namely independent claim 20, which includes allowable subject matter that is neither taught nor suggested in the references of record. Accordingly, applicants respectfully request favorable reconsideration and withdrawal of the rejection of claims 21, 23, 25, 27, 28, and 32 under 35 U.S.C. § 103(a) over the Lopatin et al. reference in view of the Matsuda reference.

Claims 31 and 33 ultimately depend from independent claim 26. Hence, claims 31 and 33 are at least allowable as depending from an allowable base claim, namely independent claim 26, which includes allowable subject matter that is neither taught nor suggested in the references of record. Accordingly, applicants respectfully request favorable reconsideration and withdrawal of the rejection of claims 31 and 33 under 35 U.S.C. § 103(a) over the Lopatin et al. reference in view of the Matsuda reference.

D. Asserted Obviousness Rejection of Claim 24

In the outstanding Office action, the Examiner rejected claim 24 under 35 U.S.C. § 103(a) as being unpatentable over the Lopatin et al. reference in view of the Matsuda reference as applied to claim 20 and further in view of the Furukawa et al. reference.

The Furukawa et al. reference fails to remedy the deficiencies of the Lopatin et al. and Matsuda references. Claim 24 ultimately depends from independent claim 20. Hence, claim 24 is at least allowable as depending from an allowable base claim, namely independent claim 20, which includes allowable subject matter that is neither taught nor suggested in the references of record. Accordingly, applicants respectfully request favorable reconsideration and withdrawal of the rejection of claim 24 under 35 U.S.C. § 103(a) over the Lopatin et al. reference in view of the Matsuda reference, further in view of the Furukawa et al. reference.

E. Asserted Obviousness Rejection of Claims 20-29

In the outstanding Office action, the Examiner rejected claims 20-29 under 35 U.S.C. § 103(a) as being unpatentable over the Furukawa et al. reference in view of the Matsuda reference and the Lopatin et al. reference.

The Examiner identified a spacer (48) in the Furukawa et al. reference. As depicted in Fig. 3e, however, these sidewall spacers lack a third element substantially parallel to the semiconductor substrate extending from a bottom of the first element into the undercut region. The Lopatin et al. and Matsuda references fail to remedy the deficiencies of the Furukawa et al. reference.

Accordingly, applicants respectfully request favorable reconsideration and withdrawal of the rejection of independent claims 20 and 26 under 35 U.S.C. § 103(a).

Claims 21-25 and 27-29 ultimately depend from independent claim 20. Hence, claims 21-25 and 27-29 are at least allowable as depending from an allowable base claim, namely independent claim 20, which includes allowable subject matter that is neither taught nor suggested in the references of record. Accordingly, applicants respectfully request favorable reconsideration and withdrawal of the rejection of claims 21-25 and 27-29 under 35 U.S.C. § 103(a) over the Furukawa et al. reference in view of the Matsuda reference and the Lopatin et al. reference.

F. New Claims 34-41

Claims 34-41 are added by the instant amendment. No new matter is added. Support for these claims may be found in the application as originally filed, for example, on page 16 in paragraph [0039] and on pages 22-23 in paragraph [0055]. Applicants respectfully request entry and examination of new claims 34-41.

G. Conclusion

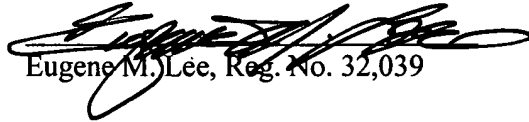
In view of the foregoing amendments and remarks, reconsideration of this application is earnestly solicited, and an early and favorable further action upon all the claims is hereby requested.

If the Examiner believes that additional discussions or information might advance the prosecution of the instant application, the Examiner is invited to contact the undersigned at the telephone number listed below to expedite resolution of any outstanding issues.

Respectfully submitted,

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PETITION and
DEPOSIT ACCOUNT CHARGE AUTHORIZATION

This document and any concurrently filed papers are believed to be timely. Should any extension of the term be required, applicant hereby petitions the Director for such extension and requests that any applicable petition fee be charged to Deposit Account No. 50-1645.

If fee payment is enclosed, this amount is believed to be correct. However, the Director is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. 50-1645.

Any additional fee(s) necessary to effect the proper and timely filing of the accompanying-papers may also be charged to Deposit Account No. 50-1645.